## Exercise Solutions for Math 20

Factoring Polynomials and Simplifying Rational Expressions

Nile Jocson

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## 1 Factor the following completely.

## 1.1 $16x^4 - 1$

$\Rightarrow (4x^2 - 1)(4x^2 + 1)$	Factor using difference of two
	squares.
$\Rightarrow (2x-1)(2x+1)(4x^2+1)$	Factor using difference of two
	squares.

## 1.2 $8j^3 - 125k^6$

$\Rightarrow (2j - 5k^2)(4j^2 + 10jk^2 + 25k^4)$	Factor using difference of two cubes.

## 1.3 $s^2 + 7s + 10$

$\Rightarrow (s+2)(s+5)$	Factor by grouping.

#### 1.4 $4n^2 - 12n + 9$

$\Rightarrow 4n^2 - 6n - 6n + 9$	Factor by grouping.
$\Rightarrow 2n(2n-3) - 3(2n-3)$	
$\Rightarrow (2n-3)^2$	

## 1.5 $x^3 - x^2 - x + 1$

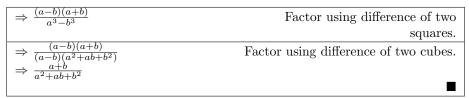
$\Rightarrow x^2(x-1) - 1(x-1)$	Factor by grouping.
$\Rightarrow (x^2 - 1)(x - 1)$	
$\Rightarrow (x-1)(x+1)(x-1)$	Factor using difference of two
	squares.
$\Rightarrow (x-1)^2(x+1)$	

## 1.6 $48 - 13q - q^2$

$\Rightarrow -q^2 - 13q + 48$	Rewrite in standard form.
$\Rightarrow -(q^2 + 13q - 48)$	
$\Rightarrow -(q-3)(q+16)$	Factor by grouping.

# 2 Reduce the following rational expressions to lowest terms.

#### 2.1 $\frac{a^2-b^2}{a^3-b^3}$



## 2.2 $\frac{x^3-x^2y+xy^2-y^3}{x^6+y^6}$

